

# **Environmental Assessment**

**Prepared by**  
**U.S. Department of the Interior**  
**Bureau of Land Management**

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# **Chapter 1. Introduction**

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## **1.1. Identifying Information:**

### **1.1.1. Title, EA number, and type of project:**

Sweetwater Basin Riparian Resilience Project Environmental Assessment

Wyoming NEPA No. WY-050–EA 15–62

Type of project: Vegetation and fuels treatment and riparian restoration

### **1.1.2. Location of Proposed Action:**

There are three proposed treatment sites:

- 
- Upper Haypress Creek: Township 28N Range 96W straddling sections 11 and 14, approximately ten miles south of Highway 287 halfway between Sweetwater Station and Jeffrey City
- Coyote Gulch: Township 28N Range 96W Section 27, approximately thirteen miles south and slightly west of Sweetwater Station
- Lower Granite Creek: Township 28N Range 97W Section 24, approximately twenty miles east of Atlantic City adjacent to the southern edge of the Sweetwater Canyon Wilderness Study Area.

### **1.1.3. Name and Location of Preparing Office:**

Lead Office - Lander Field Office

1335 Main Street, Lander, Wyoming 82520 307–332–8400

### **1.1.4. Identify the subject function code, lease, serial, or case file number:**

### **1.1.5. Applicant Name:**

Bureau of Land Management, Lander Field Office

## **1.2. Background:**

[Describe the purpose and need for the proposed action here.]

Recent work by Bureau of Land Management (BLM) and Agricultural Research Service (ARS) researchers demonstrated that livestock grazing is a major contributor to hummocks in riparian meadows. Analysis of livestock-grazing exclosures showed slow recovery with hummocks remaining after 30 years of rest (Booth et al. 2014). This research was conducted on lands within the Upper Sweetwater River watershed to the east of South Pass, Wyoming (Map 1 in Appendix A.)

The study found that these important riparian and wet meadow complexes, situated in a landscape dominated by dry sagebrush shrublands, are snow-melt influenced systems that are highly vulnerable to the effects of climate change. Currently, many are in a degraded ecological state resulting in erosion through headcuts, hummock formation and stream channelization and further exacerbated by a drying climate (USDI 2014, Booth et al. 2014, Cox et al. submitted). Reduced water-storage capacity negatively impacts wildlife and human populations at a landscape scale by reducing stable open water sources and increased flow rates seen in spring runoff often followed by diminished late-season river flow (Nayak et al. 2010; Downard and Endter-Wada 2013). The Sweetwater Basin provides important wildlife habitat including priority sage-grouse habitat.

Stable open water and the diversity of plant communities that result from proper riparian function are at risk from changing climate including reduced snowpack, reduced snow water equivalent, earlier snowmelt, prolonged drought, higher mean temperatures, and a shift from snow to rain (Mote et al. 2005; Regonda et al. 2005; Rood et al. 2000; Stewart et al. 2005). The systems are less resilient to seasonal rain storm events.

Additional recent research has been conducted by the BLM and the USDA Agricultural Service (Cox, et al., in publication) regarding current riparian condition in the Sweetwater Subbasin and the catastrophic erosion of water-storing soils through headcuts. This paper utilized aerial imagery with ground-truth verification to describe loss of soil and riparian function through headcuts and livestock-caused hummocking. The Cox paper provided the first detailed quantitative analysis of sustainable riparian land management and identification of priority disturbance-mitigation areas.

The authors of the Booth study met with the Sweetwater Basin Working Group to consider long-term research projects to evaluate various approaches to improving the recovery of hummocked riparian meadows. (The membership of the Group is presented in Chapter 5, Consultation and Coordination.) The Group began the Sweetwater Basin Riparian Climate Resilience Project (the Project) to evaluate various techniques to accelerate conserve riparian function and habitat in mid-elevation riparian systems. The Booth 2014 research established that passive restoration results in slow recovery of grazing-caused riparian degradation. The research will evaluate various types of active restoration efforts to determine if the riparian systems' resilience to climate change can be improved as well as to accelerate progress towards proper functioning condition (PFC).

The Project's long term goal is to establish six adaption and restoration approaches expected to increase hydrologic resilience to climate change and the means by which to test the efficacy of those techniques (See Map 2 in Appendix A). In support of that goal, this Environmental Assessment (EA) analyzes the first three research approaches in the Lower Granite Creek, Coyote Gulch (with State Lands and Investments) and Upper Haypress Creek sites. All six approaches are stand-alone projects which will be evaluated independently of the others. Funding for the Lower Granite and Upper Haypress Creek sites has been obtained and the proposal is for the installation of the treatments to begin in the summer of 2015. The funding for at least the fencing portion on BLM of the Coyote Gulch project is in place and it is possible that addition work

involving re-contouring, repair, and remediation of headcuts will be undertaken in the fall of 2015 when the State does its soil work

While the remaining three test sites (see Appendix B for a full description) are planned to be installed by August 2017, they have not been fully developed as of the date of this EA and funding and committed volunteers have not been fully secured. The information on restoration and resilience obtained through the Lower Granite Creek and Upper Haypress test sites will help to inform further management decisions even if the remaining three test sites are not installed; the proposed work on Coyote Gulch may not yield information that informs the other three test sites. Because of the “stand alone” nature of the three treatments, the LFO has determined that analysis of the test sites are not “connected actions” which “should be discussed” in the same NEPA document (40 CFR 1508.25(a)(1); ); see *National Environmental Policy Act Handbook* H-1790 Section 6.5.2.1 page 45). For the sake of convenience, the two sites proposed to be installed in 2015 are analyzed together in this EA although they are independent actions. The BLM considered the use of a Categorical Exclusion rather than an EA but determined that analysis of the Proposed Action through this EA would better inform the public on the important issues of riparian restoration and climate change resilience. Both of these projects require surveys and inspections by the BLM archaeologist. If the clearances for the Upper Haypress test site have not been completed at the time installation of the Lower Granite Creek site begins, a separate decision for the Upper Haypress site will be issued since the BLM’s Protocol with the State Historic Preservation Officer requires a programmatic agreement before an action may be authorized without completion of the Section 106 consultation process.

### **1.3. Purpose and Need for Action:**

[Describe the purpose and need for the proposed action here.]

This analysis evaluates two approaches (Lower Granite Creek and Upper Haypress) to improving function and resilience in two riparian areas in a livestock grazing allotment where climate change is expected to exacerbate loss of riparian function. The proposed work in Coyote Gulch is to assess one approach to remediating headcuts which contribute to the accelerated flow of water from the riparian system contributing to drying of hummocks along with severe erosion which expands the area of degraded wetlands beyond the livestock caused hummocks. If there is sufficient funding, the BLM lands will receive re-contouring and re-vegetation similar as the work to be done by the State on SLIT properties. If there are not sufficient funds, then the BLM lands will be fenced and serve as a comparison of fenced but untreated to the State’s fenced and treated. The need for the action is to accelerate the repair of degraded riparian-wetland systems not meeting the Standards of Healthy Rangelands.

The decision to be made is whether or not to authorize the two treatment projects to evaluate accelerated riparian restoration techniques in Lower Granite Creek and Upper Haypress Creek and whether to authorize the construction of fencing on BLM lands in Coyote Gulch with the likely re-contouring and remediation this fall when the State will undertake this work on State Lands.

### **1.4. Scoping, Public Involvement and Issues:**

Scoping and Issues

The BLM conducted extensive internal scoping and the consultation described in Chapter 5. The BLM identified the following issues:

- How will the riparian areas involved in the project be impacted?
- Will the project meet the visual resource management objectives for the area?
- Will the project impact the Continental Divide National Scenic Trail (CDNST)?
- What are the impacts to vegetation condition?
- Are there impacts to greater sage-grouse, a BLM sensitive species and candidate species under the Endangered Species Act?

Although the proposed projects are located in the National Trails Management Corridor (NTMC), neither alternative was considered to have impacts to the NTMC beyond those identified for the CDNST including impacts to visual resources, discussed below. The Lower Granite Creek project, although adjacent to the Sweetwater Canyon Wilderness Study Area (WSA), will have no impacts as it will be placed in such a way as to meet the WSA's visual resource management Class I objectives.

All three projects are located in areas utilized by wild horses, wildlife, and domestic livestock. However, given the relatively small size of the projects, the BLM determined that there was no meaningful difference between the alternatives in their impacts to these resources and uses except as identified below for possible adverse impacts to greater sage-grouse under the Proposed Action. Impacts from the thinning of sagebrush and dead timber and reduction of fuels load are beneficial in the Proposed Action but only meaningful in the project areas themselves and are too minor to be carried forward for analysis. The potential adverse impacts to greater sage-grouse from fencing in Lower Granite Creek and Coyote Gulch were considered meaningful and carried forward for analysis.

The types of cultural and paleontological resources that may be available on the public lands are described in detail in Chapter 3 of the GMCA and the RMP FEIS. Specifically, the GMCA EA explained: "Prehistoric sites are commonly found throughout the GMCA. Sites dating to the Paleo-Indian Period and Protohistoric Period are rare, but the other periods are well represented. The locations of these sites are associated with water sources, availability of food plants, game availability, material availability, and climatic characteristics. Known and suspected high-density prehistoric site areas fall along the Sweetwater River, near permanently or seasonally watered creek drainages, and around springs."

The LFO applies standard mitigation for the protection of cultural resources; see Appendix E. In light of this mitigation, the BLM determined that there was no meaningful difference in impacts to cultural resources under either alternative and cultural and paleontological resources are not further analyzed.

The BLM identified possible impacts to soil chemistry from the Proposed Action at the Upper Haypress project area since the acidity of the timber is much higher than that of typical riparian vegetation. However, the BLM determined that the proposed treatment would not likely result in a meaningful increase in acidity so as to impact riparian vegetation or water chemistry (conversation with BLM soil scientist Greg Bautz (retired), May, 2015.)

Environmental Justice: All three project areas are in remote, unpopulated areas. Neither alternative will have a disproportionate impact on minorities or low-income populations. Accordingly, environmental justice issues are not addressed in this document.

Livestock grazing: The BLM determined that under both alternatives there would be no meaningful impacts to livestock grazing. Although the proposed treatments in each of the project areas would limit access of livestock to riparian areas, the BLM determined that this limitation had a minor and unimportant impact to livestock grazing, particularly given the very small percentage of the allotments that each project would represent. Accordingly, livestock grazing is not described or analyzed in this document. However, the EA tiers to the Affected Environment and Impacts Analysis of the GMCA decision., which was a livestock grazing decision. Therefore, so that the reader may place the proposed projects within the context of the GMCA analysis, some of the maps show the livestock grazing allotments described in the GMCA Decisions.

Note: the BLM considered the use of a Categorical Exclusion rather than an EA but determined that analysis of the Proposed Action through this EA would better inform the public on the important issues of riparian restoration and climate change resilience.

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## **Chapter 2. Proposed Action and Alternatives**

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## 2.1. Background

The purpose of this section is to identify a range of reasonable approaches or alternatives for the BLM to resolve the purpose and need for the action. The NEPA Handbook provides that the “proposed action” is a proposal for the BLM to authorize, recommend, or implement an action to address a clear purpose and need, and may be generated internally or externally. While the proposed action is one possible option to meet the purpose and need, other alternatives are developed to consider different reasonable paths to accomplish this purpose and need (HI-1790–1 Section 6.5.)

## 2.2. Description of Alternatives Analyzed in Detail:

### 2.2.1. Proposed Action

The Proposed Action is to install different treatments in three areas of the Sweetwater Subbasin so that the BLM can evaluate different approaches to riparian restoration and improvements to climate resilience. As discussed above, degraded riparian conditions occur throughout the former Green Mountain Common Allotment and the BLM is interested in accelerating remediation over the passive approaches more typically taken. These three approaches are:

1. Lower Granite Creek: Utilizing cut sagebrush placed between riparian meadow hummocks to capture sediment and low water movement. Test plots will be both fenced and not fenced.
2. Coyote Gulch: Addressing headcuts and an incised channel through fencing and re-contouring of headcuts, utilizing fabric mats and re-vegetation.
3. Upper Haypress Creek: Using dead timber placed at an angle to the down stream flow of a stream to capture sediment and deter livestock from using the riparian area. The test plots will not be fenced but are located adjacent to an existing fenced pasture area in the riparian system which serves as a control.

The following is a more detailed description of the Proposed Action:

#### Site One: Lower Granite Creek

Problem to be addressed: Lower Granite Creek is fed by a series of springs located on both private and BLM lands within the Antelope Hills Livestock Grazing Allotment. Erosion within the system has resulted in an incised channel and headcutting toward the spring source. Increased water energy in this system continues to erode the channel, and fails to capture sediment or retain water necessary to support riparian obligate species, such as sedges, outside of the narrow greenline.

Project goal: Stabilize the existing channel and rebuild the channel gradient via sediment capture in an effort to encourage greater riparian stability and water storage. Increase floodplain connectivity by reducing channel incision; elevate water table.

Research question: Can woody shrub/tree trimmings such as sage brush be placed in the channel and riparian zone dissipate water flow energy, capture sediment and improve riparian habitat (1) in the presence of continued livestock grazing or (2) fenced from livestock grazing?

Proposed Study: Stabilize the headcuts through the use of sagebrush cuttings and in two test sites livestock exclusion. Four treatment areas, each 50m in length down the channel by variable widths of ~40-50m cross-channel will be established, two of them fenced; see attached schematic. The four test sites are (moving downstream): Site A (shown as “GCU” on the schematic) unfenced and untreated; Site B (“GCF”) fenced but untreated; Site C (“GCUT”) unfenced but treated; and Site D (“GCFT”) fenced and untreated.<sup>1</sup>In the two treated blocks, sagebrush nearby the riparian area will be cut and placed within the channel to dissipate waterflow energy and encourage sediment capture. <sup>2</sup> Short wooden lathe stakes will be hammered in at an upstream angle to hold woody material in place. The continued existence of the exclosures will be determined at the end of the 20-year monitoring period. This analysis assumes that the exclosures will remain in place; removal at the end of 20 years will require NEPA analysis at that time. The sagebrush will be thinned from nearby areas (see map in Appendix A) with dense sagebrush stands but a 15% canopy cover will remain after cutting. All fences would be marked with suitable sage-grouse deterrents and posts would have anti-perching devices. Potential future work: In addition to the identified treatments in Lower Granite Creek, the Working Group identified some possible treatment areas on nearby land owned by The Nature Conservancy. In general, similar types of treatments would be evaluated. However, this work is still indefinite so it will not be further addressed in this EA and will require subsequent NEPA analysis if the treatment is considered to be a federal action.

The monitoring plan for the Lower Granite Mountain site is outlined in the Project Proposal in Appendix C. Approximately four to six annual visits to check for fence conditions, stability, monitoring, and other needs will likely occur. Over time, the number of visits will decrease but it is possible that identified maintenance needs will require additional site visits. The monitoring plan for the Lower Granite Mountain site is outlined in the Project Proposal in Appendix C. Approximately four to six annual visits to check for fence conditions, stability, monitoring, and other needs will likely occur. Over time, the number of visits will decrease but it is possible that identified maintenance needs will require additional site visits.

The effectiveness of the treatment will be determined on the basis of the following criteria:

- Treated area will show a statistically-significant decrease in surface roughness (a measure of hummocking) and an upward trend in vegetation cover/composition.
- Specifically, bare ground cover will decrease, cover of upland species such as western wheatgrass, Kentucky bluegrass, pussytoes, wild iris, Baltic rush, Canada thistle, rubber rabbitbrush and shrubby cinquefoil will decrease while obligate riparian species such as Nebraska sedge (or other sedges like Geyer, Douglas, Elk and Water), tufted hairgrass and willows (several potential species) will increase in cover.
- Over time, headcuts and erosion will be reduced.

### Site Two: Upper Haypress Creek

Upper Haypress Creek is located on the north slope of Crooks Mountain. The head of this system is characterized by several wet meadows capable of higher vegetative productivity and water storage. These meadows are dominated by Nebraska sedge and tufted hairgrass as the key

<sup>1</sup>A schematic of the proposed treatment area showing location of transects is provided in Appendix E.

<sup>2</sup>If sagebrush cuttings are found to be inadequate for sediment capture or do not remain in place juniper and limber pine limbs (from downed or beetle kill trees) will be used instead. Removal of beetle kill will require subsequent NEPA analysis to look at the source of the trees, distance from the treated areas, and impacts associated with the movement of the timber.

species. Hummocking and trailing on these meadows has resulted in braided channelization of the meadow and a loss in soil stability and hydrology in the system. The tops of hummocks have transitioned to a mix of Kentucky bluegrass and Nebraska sedge throughout most of the system. Haypress Reservoir is located below the wet meadows where the drainages come together into Haypress Creek. This reservoir reliably holds water throughout the grazing season. Below the reservoir, topography forces the system into a narrow drainage forming Haypress creek on private lands. Woody vegetative species such as willows become more prevalent through this section of the system.

Research Question: Can hummocks and cattle trails be mitigated and general riparian conditions improved, under continued livestock grazing, by adding beetle-kill timber in the riparian area to discourage cattle trailing and loafing?

Project Goal: Mitigate hummocking and cattle trails and improve riparian condition while continuing to authorize livestock grazing in riparian areas.

Proposed Study: Collect beetle-kill timber (large branches, limbs and logs) from nearby areas (see map), cutting down dead trees if still standing, and haul the timber to the riparian area. The would be located within 30m of an existing fenced area that has been closed to livestock grazing for approximately seven years. The transects within the existing fenced area are approximately 80m apart.

Three new treatment blocks, each 50-m long and as wide as the riparian area (of variable widths approximately 12-22m), will be established, each separated by approximately 10m of untreated riparian area; see attached schematic. The logs and limbs will be placed in bands at 20-m intervals perpendicular or at an angle to the channel within each treatment block.<sup>3</sup>The purpose of the logs is to discourage livestock trailing from the pasture's top to bottom through the riparian area to access the existing reservoir at the bottom of the pasture. This should help discourage loafing, as livestock are forced to head into the upland area to reach a different area in the riparian area. The treatment blocks are separated by approximately 100m. Transects within the untreated Transects installed in the untreated A rough sketch of the site layouts is provided in Appendix C.

The timber bands should be tall and wide enough to discourage cattle crossing. This treatment doesn't exclude livestock from the riparian area, but seeks to deflect trailing in the riparian area and divert livestock traffic into the uplands. The woody material also serves to slow water flow and to collect sediment to fill in hummocked areas. If the action effects increased water storage and a raised water table, vegetation cover and composition should change in response.

Approximately 200–300 dead trees will be removed from existing timber stands less than one mile away from the treatment area; see photo in Appendix D. Some of these trees are down but most are standing dead and would need to be selectively cut utilizing a handheld chain saw and dragged to the treatment site by four wheelers. The BLM may also elect to utilize a “forwarder” which is a skid/trailer mounted arm that would cut the timber and load it on the back skid portion of the truck and driven to the existing two track although at the present time, there does not appear to be funding to support this approach. A photo of a typical forwarder is provided in Appendix D. The selection of techniques to collect the dead material will depend upon the availability and cost of the forwarder and its ability to handle the type of steep terrain to access the timber in reasonably near proximity to the treatment area. The source locations for the timber are shown

<sup>3</sup>A schematic of the proposed study is provided in Appendix E.

on Map 7 in Appendix A. This EA analyzes impacts associated with the two different types of cutting and conveyance processes although it is likely that only one process will be utilized.

The monitoring plan is provided in Chapter 4 and provides for approximately 4-5 site visits annually.

Potential future work: Soap Holes is an adjacent drainage that shares characteristics of Upper Haypress and is a logical choice for a second similar treatment. However, it is farther from dead timber than Upper Haypress and may not be within the capabilities of the Working Group to implement because of the need to monitor the sites moving forward. A possible approach would be to install a similar type of treatment in Soap Holes without the ongoing monitoring and measurements being deployed in Upper Haypress, installing the treatment areas as time and funding allows.

### Site Three: Coyote Gulch

Coyote Gulch is characterized as an intermittent drainage approximately 1.5 miles in length. The upper reaches are dominated by a series of wet meadows and springs before transitioning into a channelized system in the lower sections of the drainage. The channel has been downcut over time by a series of nick points and headcuts resulting in a loss of overall hydrology and water holding capacity in the system. In order to prevent continued loss of hydrology in the system, the State of Wyoming proposes to stabilize these headcuts through mechanical means followed by exclosure fencing to prevent grazing use of the riparian area. The short term goal of this stabilization is to arrest the current level of erosion and downcutting occurring in the system. The long term goal is to stabilize and repair the existing drainage through the aggradation of sediment and stabilizing vegetation.

A total of five headcuts throughout the drainage, three located on State of Wyoming lands and two located on BLM lands, would be fenced to exclude livestock. Each exclosure would fence off approximately .5 acre for a total of 2.5 acres or approximately 2,500 feet of fencing. The fences would be constructed with the top 2 wires consisting of barbed wire and the bottom wire smooth for a total of 3 wires. The bottom wire would be placed at approximately 16 inches off the ground with the center and top wires measured at 26 inches and 38 inches respectively. The fence posts would be T-posts with wooden corner posts. These fences will be in place for approximately 10 years. After 10 years, the necessity of the proposed fences will be re-evaluated, and either removed or a new timetable for removal will be established based on the achievement of the stabilizing objectives.

In addition to the fencing, the State of Wyoming proposes to stabilize the three headcuts on State lands. Each headcut will be regraded through either the use of hand tools or a back hoe. The resulting slope will be seeded with an appropriate seed mixture to establish native riparian vegetation and lined with geotextile fabric such as Rolltex mats; information on these mats is provided in Appendix F. The purpose of the mats is to dissipate water energy and slow erosive forces and to allow the seeding to become established. Overtime, the mats will disintegrate and become incorporated into the soil. The BLM proposes that if there are sufficient allocated funds and contractor time to address the headcuts on BLM managed lands when the work is done in the fall of 2015 on State lands, the same mechanical treatment to recontour the slope, reseed, and install geotextile fabric will occur on the BLM lands. If there is not currently adequate funding, the BLM fenced but untreated headcuts will serve as a control to identify the potential for stabilization through fencing alone. Depending upon the success of the State's headcut

remediation in comparison to the condition of the BLM's untreated areas may indicate that mechanical stabilization in the future is necessary.

All fences will be marked to improve visibility to greater sage-grouse and anti-perching devices will be installed on corner posts. If the BLM lands are treated, the same design as the approach to be taken on State lands will be utilized.

### **2.2.2. No-Action Alternative**

The No Action alternative “provides a useful baseline for comparison of environmental effects (including cumulative effects) and demonstrates the consequences of not meeting the need for the action (NEPA Handbook Section 6.6.2 at page 51).” Under the No Action alternative, the BLM would not introduce the cut sagebrush or timber at either of the study locations and livestock grazing management would continue as authorized in the Final Decision Antelope Hills Allotment and Final Decision Arapahoe Creek Allotment WY-050-EA11-5 based upon analysis in the Green Mountain Common Grazing Management Environmental Assessment (GMCA EA), available online at: [http://www.blm.gov/wy/st/en/info/NEPA/documents/lfo/greenmtn\\_common.html](http://www.blm.gov/wy/st/en/info/NEPA/documents/lfo/greenmtn_common.html).

## **2.3. Alternatives Considered but not Analyzed in Detail**

The BLM considered evaluating the use of traditional fences in the Upper Haypress Creek project site in addition to the dead timber (fencing alone being evaluated in the existing enclosure.<sup>4</sup> This alternative was not further analyzed because:

- The project area is adjacent to the CDNST and within the National Trails Management both of which are Visual Resource Management (VRM) Class II. The use of natural materials such as dead timber was determined to cause less of a contrast with the setting than fencing. The RMP's requirement to mark fence lines to enhance their visibility to greater sage-grouse would increase this contrast as viewed from the CDNST.
- The labor in installing and maintaining fencing was too burdensome. The BLM ability to maintain existing fencing is decreasing in the face of reduced staff and budget. While fencing is utilized in two of the test blocks in the Lower Granite Creek site, they are relatively small in size, requiring approximately 5000m each of fencing, and at a location that is more accessible than the Upper Haypress Creek location, and thus more suitable for maintenance by volunteers (see Chapter 4 Monitoring).
- Fence posts can be predator perches which the BLM strives to avoid in greater sage-grouse habitat.
- The BLM desired to try to reduce or eliminate the use of fencing material in a location where alternatives were available. Upper Haypress has several areas that have dead timber that could be removed and utilized at the project without needing to be transported over extensive distances. (This is the same rationale for using cut sage brush in Lower Granite Creek.) Dead timbers do not require maintenance and as the material breakdown, it will be incorporated in to the site providing carbon and other organic material. Fencing material is expensive to buy and install and as it degrades over time, it requires removal and recycling.

<sup>4</sup>Since the area has already seen considerable improvement since the fencing was installed, side-by-side comparisons will not be possible.

- The selective removal of standing dead and fallen timber would reduce the fuels potential of the treated area and would facilitate sediment capture and reduce erosion in a way that fencing alone does not capture.

The BLM did not consider other research site locations, such as outside of the NTMC (see Map 3) because:

- The BLM designed the research projects in consultation with experts who have studied the resource and riparian conditions of the Sweetwater Subbasin extensively. This consultation helped the BLM to determine the types of riparian reclamation and remediation approaches could be assessed at each of the project locations. The BLM determined that these locations were maintainable by volunteers with a long term commitment to monitoring. Since the BLM has limited ability to conduct this monitoring, deferring to the suggestions of the working group was deemed reasonable.
- The existing research focused on the Sweetwater Subbasin which provides substantial information on current condition at the proposed sites. The Sweetwater Subbasin was the subject of extensive analysis in the GMCA EA. While it is likely that this background information could be referenced in other areas of the Lander planning area that were not part of earlier work, that was deemed to introduce a new research question: is the knowledge gained in the Booth and Cox studies applicable to other watersheds? The BLM determined that introducing this uncertainty would diminish the value of the research results.

The BLM considered other resource locations more distant from the CDNST but within the NTMC (Map 3) to reduce adverse impacts to visual resources and the primitive character of this section of the CDNST. This was not analyzed in detail because:

- The projected improvement to the riparian wetlands at the Upper Haypress Creek location would be a long term benefit to the setting of the CDNST and result in improve appeal to the users of the Trail at an existing water source that is already fenced.
- The project is in keeping with existing improvements to limit the adverse impacts of livestock grazing on recreational use.
- The CDNST crosses a number of riparian areas in the Sweetwater Subbasin as the CDNST makes its way westward through the Lander planning area. Many of these riparian areas are currently in degraded condition with extensive hummocking. Moving the Upper Haypress study area to an area further removed from the Trail would have the same effect on the proposed study site adjoining the Trail as the No-Action Alternative. If more rapid improvement to riparian areas is expected through treatment then improving an area emphasized for Trail recreational use more quickly was determined by the BLM to be a benefit of the proposed location.

## 2.4. Conformance

The EA is in conformance with the Lander Record of Decision and Approved Land Use Plan (RMP). Decisions 4028–4030 identify management improve riparian habitat. The Sweetwater River watershed and greater sage-grouse Core Area are identified as management “priorities” Decision 4041. Allotments with degraded riparian wetlands and allotments with the greatest opportunities for riparian-wetland habitat improvements are emphasized as priorities Decision

6058. Vegetation treatments are allowed in core Area to conserve, enhance, or restore habitat  
Decision 3012.

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## **Chapter 3. Affected Environment:**

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This Affected Environment Chapter describes those resources (“affected resources”) and uses in the study areas that will be impacted (beneficially or adversely) by the alternatives. This EA combines a description of the affected environment with an analysis of the anticipated environmental impacts to the affected resources by each alternative in this one paragraph.

The following critical elements are not present in the analysis area or will not be affected differently by the alternatives: sole-source drinking water, prime or unique farmlands, hazardous/solid wastes, health and safety, transportation, forest management, paleontological resources, and lands and realty. The Proposed Action will result in minor, temporary increases in noise but this change was not considered as large enough to require environmental analysis and did not conflict with the noise limitations set forth in RMP Decision 4117 and Decision 7003. Accordingly, noise impacts are not further described in this section. Neither alternative will result in a disproportionate impact to low-income or minority populations. Accordingly, these resources and issues will not be further addressed in this EA.

The current condition of the three proposed project areas was thoroughly described in the sections of Chapter 3 of the Green Mountain EA that address riparian areas. Consequently, this EA will not repeat that analysis but will only describe the project areas in more detail as needed to assess the environmental impacts under each of the alternatives.

### **3.1. Background**

The Upper Granite Creek Project is located in the Granite Creek Rocks Pasture of the Antelope Hills Allotment in Section 14, Township 28 North, Range 98 West (see Map 1). The riparian area along Granite Creek was determined in 2004 not to be in Proper Functioning Condition (PFC) but was functioning at risk with no apparent trend. The livestock grazing management authorized in the Antelope Hills Decision was deferred, rotational grazing with no more than 30 days in any one pasture. Effective implementation of this rotation has not been achieved because the Granite Creek-Rocks Pasture Fence, which the Decision indicated was a prerequisite to effective herding, will not be completed until the spring of 2016. The lack of effective livestock herding coupled with a year of severe drought (2012) has resulted in little improvement of Granite Creek since the Green Mountain EA described the affected environment as of 2011 (observation of M. Rutledge, BLM RMS). As indicated in the GMCA EA, it is likely that livestock remain in the riparian areas until they have consumed most of the desirable forage. “Wetland-riparian areas receiving heavy utilization of vegetation and trampled until they have dried out do not perform their natural functions of retaining sediment, holding back water, cooling water by shading, and providing productive habitat for wildlife (GM EA at page 4-17).”

The GMCA EA identified that the management authorized in the two Decisions had both the potential to improve overall allotment health but carried a risk of potential adverse impacts given that livestock numbers would be approximately the same as in the past which resulted in resource damage. When the range infrastructure improvements are in place, the BLM will monitor rangeland health.

### **3.2. Climate Change/Air Resources:**

Impacts from Climate Change and Air Resource : A warming climate and chronically diminished snow packs are putting more strain on water resources in the western United States. Properly functioning riparian systems slow runoff and store water, thus regulating extreme flows (Cox, et

al. in publication). Increasing higher mean annual temperatures (see papers cited by Cox) has exacerbated erosion by shifting precipitation from snow to rain with rain driving more channel erosion than snowmelt. Earlier snowpack melting is expected to continue and increasing warm weather storm events are likely to occur resulting in increasing loss of soil through erosion. Higher temperatures and earlier runoff will result in increased soil and vegetation drying and reducing ecosystem function. The impacts from climate change to each of the affected resources are described below under the specific resource.

Impacts to Climate Change: Neither alternative taken alone is expected to have a measurable impact on climate change in part because limits of current technology limits quantification of data to only a very broad scale such as the northern Rocky Mountain region. However, on a project level basis, the two alternatives will have varying impacts to climate change, albeit too small to be quantified. To the extent that water and soil resources are beneficially impacted by each alternative, ecological function will improve, thus impacting climate change through better absorption of precipitation and carbon dioxide, one of the keystone greenhouse gases (GHG). Increased carbon storage capacity and organic matter will improve vegetative health which will improve the ecological services in the project areas. Reductions in bare soil will reduce fugitive dust improving air quality. The Lower Granite Project is located more than 25 miles from the Popo Agie Wilderness, the nearest Class 1 airshed; the prevailing winds generally blow away from the Wilderness.

The BLM anticipates that the ecological function of the treated areas in each of the project sites will improve more rapidly than in the untreated areas, resulting in an increased resilience to these likely consequences of climate change. The Booth 2014 research suggests that these improvements are likely to be achieved less rapidly in the treatment only areas than in the fenced but untreated areas although the improvements observed in the existing fenced area in Upper Haypress (in an enclosure established to improve the area around a water source for the CDNST) suggest that fenced areas will improve more rapidly than under the No-Action Alternative. As analyzed in the GMCA EA (as Alternative 2), the range infrastructure to be constructed in the future, especially the Granite Rocks fence, will beneficially impact climate resilience but at a slow pace.<sup>1</sup>

The risks from the authorized livestock use identified in the GMCA EA are more likely to occur under the No Action Alternative than under the Proposed Action's treated or fenced areas. (Since livestock grazing would be excluded in the fenced, untreated areas, it would not run the risks of the higher intensity grazing identified in the GMCA EA although its function and thus its resilience will increase more slowly than the treated areas.)

Since the ecological function of the treated areas is expected to improve, their ability to absorb GHG and beneficially impact climate change will increase. As bare ground decreases and hummocking is reduced, less moisture will evaporate from the project areas (or be lost through precipitation caused erosion) and fugitive dust will decrease. Fugitive dust is a direct factor on the degree to which soil, water, and vegetation contribute to the reflection/retention of heat associated with GHG. Reduction in fugitive dust will reduce particulate matter in the atmosphere on snow fields and glaciers and water bodies and reduce the albedo effect by covering highly reflective surfaces, particularly snow and ice, with heat-absorbing, non-reflective dust particles. For a more description of the albedo affect see the Air Resources section of the RMP FEIS.

<sup>1</sup>The BLM acknowledges that changing climate may result in new responses to various treatment approaches that differ from the responses that have been observed in the past. An important goal of the proposed research is to quantify what responses to treatment result under current and future climate conditions.

Decreased albedo is considered to amplify global warming. See Warren, 2007 available online at: [http://www.atmos.washington.edu/sootinsnow/PDF\\_Presentations/IlulissatCODELv2.pdf](http://www.atmos.washington.edu/sootinsnow/PDF_Presentations/IlulissatCODELv2.pdf). The Proposed Action's beneficial impact on climate change will occur under the No-Action Alternative as well but much more slowly and only if the risks identified in the GMCA EA from higher intensity livestock grazing are avoided.

While not specifically an environmental impact, the BLM's overall mission of multiple use and healthy rangeland management will be furthered by the Proposed Action. The information to be gained from the different types of treatment in contrast with the continued passive management under the No-Action Alternative will inform BLM's management in other places with degraded riparian areas and areas with extensive damage caused by livestock grazing, trampling and trailing.

### **3.3. Riparian Resources**

The meadows and wetlands such as the Lower Granite Creek area are, like most of the upper Sweetwater Subbasin, seriously degraded. Widespread erosion has reduced or eliminated ecological services function within this area (Cox, in publication). Lost soil organic matter (SOM) results in a loss of both nutrients and water storage capacity. The catchment effect of a wetlands system is highly influenced by vegetative cover. Degraded riparian areas including incised channels and hummocking within those areas, contributes to continued erosion not only in the project area but those areas downstream of the project area.

Since the 2011 Decisions, livestock management has continued at the same use levels as the preceding 30. In some cases erosion within the riparian system has resulted in an incised channel with headcutting occurring toward the spring source. One consequence of an incised channel is a lowering of the water table and decrease in water retention water necessary to support riparian obligate species, such as sedges, outside of the narrow greenline. Increased water energy due to the lack of healthy riparian vegetation in this system continues to erode the channel transporting sediment downstream.

#### **3.3.1. Impacts to Riparian Resources from the Proposed Action**

Lower Granite Creek: Beneficial impacts to riparian resources from the Proposed Action are expected in the short term for the three blocks in Lower Granite receiving either a fence or sagebrush cuttings or both as well as long term improvement that will continue over time. In the lower Granite Creek project site, it is likely that the most benefits will be seen in the Block A (see Map) which will receive both sagebrush treatment and fencing as eliminating grazing. Coupled with the sediment trapping and reduced speed of run-off from the branches, this block should experience the most immediate benefit to riparian health. The benefits from sagebrush treatment alone are unknown (Block C of Lower Granite Creek) but this block is expected to be more beneficial than merely excluding livestock grazing (Block B).

It is expected that the cut sagebrush will be less effective at excluding livestock than the fenced blocks. An important benefit of the research is to evaluate the success of unfenced treatment (Block C) with its reduced costs and maintenance (see above under "Considered but Not Further Analyzed) and the lower contrast to the visual resources. The research conducted by Booth, et al. 2014, suggests that fencing alone (Block B) will provide less of a beneficial result than either Block C or D (fenced and treated) and that any benefit to riparian resources from fencing alone would likely be very slow with only modestly more benefits than allowing 30 days of livestock

grazing but otherwise untreated.(Block D). For Blocks B through D, the beneficial impacts are expected to increase over time as vegetation increases and provides additional soil stability. These benefits are expected to be achieved at different rates. Reduced erosion should be observed and retention of more water in the wetland system should occur.

Block A (unfenced and untreated) is expected to receive approximately the same type of benefit to riparian resources as the No-Action alternative discussed below. However, it is possible that these benefits will be less meaningful if the management of Blocks B through D results in increased livestock use of Block A because use of the other three blocks is impeded.

One of the expected benefits of the experiments is that improvements to the degraded riparian areas will be quantified, thus providing information that will allow the BLM to apply similar treatments, if successful, to other areas. Much of the sagebrush in the Lander planning area exhibits the same decadent condition as is present near the Lower Granite Creek-Rocks area and would benefit from thinning (BLM, 2012). Since the project area is in the 12” or less precipitation zone, prescribed fire is discouraged as a treatment method.

Upper Haypress Creek: The projected benefits to the riparian area in the Upper Haypress Creek site may continue only as long as wild horses and domestic livestock use is restricted by the timber. The duration of this benefit will need to be assessed as the timber breaks down and is less of an impediment. It is possible that the project benefits will be realized only in the short to medium term while the logs impede access to the area and that there will be no long term benefits. It is also possible that the improvement in riparian health will be sufficient to make the area resilient enough to sustain moderate wild horse and livestock use over time.

Coyote Gulch: The fenced areas in both the State and BLM lands would benefit from fencing even without additional re-contouring or fabric being placed down. Based upon the findings of Booth and Cox, these improvements are expected to be greater in the treated areas where the existing hummocks and headcuts are manually removed (assuming that there is funded to continue the recontouring on BLM lands) and fabric put in place to expedite treatment benefits. If the fenced area on BLM is not recontoured then the benefits from the riparian while likely to be visible (based upon the difference in water retention capacity in the existing fenced area in Upper Haypress Creek) but are unlikely to have much improvements to hummocking, at least in the short to medium term.

For those areas outside/upstream of the fencing, the water retention capacity of the unfenced areas should improve but less so than if all livestock use were curtailed. It is possible that the increased water in the unfenced area will encourage livestock loitering, particularly in the hot season, which could result in adverse impacts to the unfenced area, at least in the short term. Since the grazing rotation system limits use in the allotment to 30 days, the extent of this possible increase in use would also be limited but it has the potential to have greater adverse impacts than under the No-Action Alternative in which use would not be concentrated. However, as is discussed below, the increased water retention from the improvements is likely to exceed any possible adverse impacts to the unfenced area from increased use.

### **3.3.2. Impacts to Riparian Resources from the No-Action Alternative**

The No-Action Alternative will continue the management identified for Alternative 2 in the GMCA EA with an expected slow benefit to riparian vegetation with resulting very gradual

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*Impacts to Riparian Resources from the No-Action Alternative*

improvement to water holding capacity. These qualitatively identified benefits have not been quantitatively measured so that the actual benefit is unknown. The BLM expects that the Lower Granite Creek area would experience only very modest immediate or medium term improvement and depends entirely on successful herding that will be possible only after the construction of the new Granite Creeks-Rocks fence. Moreover, even these slow improvements may not occur. As the GMCA EA indicated, the higher intensity livestock grazing approach under the No-Action Alternative is riskier than lower use. Should the possible risks occur, the healing effect of the herding may not be enough to offset the continued adverse effects from increasing climate change effects and no progress in riparian health will be achieved. As the GMCA EA acknowledged, the passive approach to improving rangeland health through control of livestock numbers and seasons of use, carries the potential of continuing and not halting the ongoing and long term degradation of riparian resources and vulnerability to changes in the timing and type of precipitation.

Moreover, the GMCA analysis followed the traditional BLM assumption that slow, modest improvements result from limiting livestock grazing less than seasonal long grazing (in this case no more than 30 days in any one pasture.) This assumption could not take into account non-grazing related variables such as drought cycles and the BLM lacked the tools to measure the incremental changes following the new management. An important objective of the study is measure whether the change in livestock grazing systems resulted in the assumed benefits. In addition, the study will add an additional component beyond excluding livestock grazing, active remediation through the use of the cut sage brush, to evaluate if more rapid improvement is possible.

Comparing the success of passive approaches to riparian restoration against active restoration is particularly critical given the increased stress to riparian health and ecological function from changing climate. Even well documented benefits from prior changes in livestock grazing management may not be predicative of results under today's very different precipitation and temperature patterns. The study is designed to provide repeatable, quantitative analysis of on-the-ground conditions to guide other restoration efforts. Moreover, the results of Booth et al., have demonstrated that improvements observed in areas that have been fenced from livestock grazing for 30 years or more occur extremely slowly. Climate change predictions suggest that this progress will be even slower and may not be sufficient to provide the resilience to change that is needed for the degraded landscapes to heal.

Note: the study is not intended to provide a direct comparison of one study site to another since all study sites are not exactly the same (nor is it likely in actual field conditions to replicate a site exactly.) Instead, the changes in each site will be observed over time and documented. This documentation should provide insights to support the choice of appropriate remediation techniques for approaches to be taken in other riparian systems. The study may find that meaningful improvements to conditions can be achieved through the use of sage brush material placed in hummocks without fencing, under the same climate inputs as measured for fenced areas, for example although perhaps fewer benefits than where fencing is also used. These results would allow the BLM to evaluate whether the additional benefits from fencing were justified considering fencing's adverse impacts to wildlife and viewshed and the ongoing maintenance costs of fencing.

This study directly addresses the criticism that BLM livestock grazing management assumptions are "faith based" rather than supported by quantified results following management changes by yielding accurately measured changes in identified parameters. The No Action Alternative will not provide any information regarding the success of any approaches to reversing long term habitat degradation other than observing over time through limited monitoring transects. Alternative approaches will not be evaluated. All of project sites will be managed similarly to

the rest of the allotment, providing no unique information as to methods to improve riparian resilience to climate change. Moreover, as precipitation patterns change to increasing summer storm events and in the face of increasing mean temperature, it is possible that a “tipping point” or self-reinforcing feedback loop has or will occur, rendering prior assumptions invalid. The BLM does not consider that this point has been passed as yet but one of the benefits of the research under the Proposed Action is that the BLM will have quantitative measurement of the progress that results (or does not result) from the various types of treatment.

### 3.3.3. Impacts to Upland Resources

The riparian pastures are severely hummocked (see photos in Appendix D) with loss of soil carbon and water storage capacity. The uplands adjoining the riparian area have some dead or decadent sagebrush or have excessive brush cover due to grazing pressure. It is likely that livestock use of uplands is generally light to low moderate (see GMCA EA although formal monitoring or assessments have not been completed), the late seral stage of sagebrush is sometimes less than desirable but meeting rangeland health standards when last evaluated. However, there may be some less than desirable upland conditions, particularly near to riparian areas that where grazing pressure is higher and sagebrush cover may be excessive due to livestock grazing pressure on grasses. Note, it is possible that Antelope Hills may have experienced more uplands use than in other parts of the former GMCA. It is also possible that parts of the area have received much higher use during the period when the National Historic Trails were actively being used by emigrants. Some of these areas continue to reflect very high use occurring 150 years ago (personal conversation with John Likins, 2014). The BLM is currently conducting various rangeland assessments that should provide additional information regarding this formerly intensive use.

#### Impacts to Upland Vegetation under Both Alternatives:

Neither the Proposed Action nor the No-Action Alternative is expected to have a meaningful change in the use of the upland vegetation. While decreased use of the riparian areas under the Proposed Action would increase the use of the upland vegetation by livestock grazing, the use of the uplands is substantially below its carrying capacity (GMCA EA). Sage brush will be selectively cut to insure that the remaining cover will be at least 10-15% to retain adequate cover for sage grouse. The Proposed Action will result in beneficial impact to the areas thinned to provide the vegetative material used in the treatment (in no case to reduce sagebrush cover to below 15%) but, due to the limited number of acres being treated, that benefit is considered to be minor. The increase in livestock use of the untreated areas that may occur from the fenced enclosures or the sagebrush cuttings may adversely impact the untreated surrounding areas. The BLM does not consider that this increased use will outweigh the benefits to riparian health of the treated areas. It is also possible that in the Haypress project area, livestock grazing will create new trails which will perform the same function of channeling precipitation causing adverse impacts to upland vegetation that is similar to the impacts currently observed in the riparian area. Such adverse impacts are less meaningful to the ecosystem's health since the benefits of the riparian areas are much more important than the surrounding uplands. Moreover, the change in upland use is more likely to result in undulating trails in accordance with the type of treatment. There may be an increase in adverse impacts to vegetation from the increased trailing but undulating trails would be better at reducing the energy of the erosive effect of run off than the straighter adjacent areas that currently exist in the Upper Haypress project area.



### 3.4. Wildlife and Greater Sage-Grouse

All of the project areas are located in areas extensively used by wildlife including migratory birds, big game, and nongame wildlife. Wildlife in the GMCA area is described in detail in the GMCA EA at page 20 *et seq.* However, given the small size of the proposed project areas and the limited potential for adverse impacts under either alternative, as well as the thorough analysis of wildlife in the GMC A EA, no further analysis of wildlife is provided here. Instead, analysis of the potential impacts to greater sage-grouse is provided. The impacts to greater sage-grouse are considered typical of sagebrush obligate wildlife in general. For example, adverse impacts to greater sage-grouse from fences, for example, would also identify adverse impacts to many other sagebrush obligate species. Benefits to greater sage-grouse from improved riparian conditions would be typical of the benefits to many wildlife species that could be achieved under the Proposed Action.

All projects are located in Greater Sage-Grouse Core Area<sup>2</sup> as well as within the area identified by the United States Fish and Wildlife Services (the Service) to be a “highly important landscape”; see Map 3 in Appendix A. Both the Lower Granite Creek and Coyote Gulch Projects are less than two miles from the nearest lek but both are outside of the 0.6 mile area around leks that is closed to surface disturbing activities. The project area at Upper Haypress Creek is located farther from occupied leks than the other two project areas.

The RMP requires that the BLM consult with the WGFD on any project in Core Area as well as to comply with seasonal timing limitations, distance from leks for surface disturbance and other protective measures (see Decisions 4098 *et seq.*). The BLM consulted with the WGFD and it was determined that no “disturbance density calculation” needs to be completed, based upon the information contained in the WGFD’s worksheet as long as the amount of sage brush being used for the project does not decrease the percentage of cover below 15%. The project design of the Proposed Action selects dense sagebrush stands for treatment and requires that the thinning does not exceed the 15% threshold. If it becomes possible to undertake the headcut re-contouring, the BLM will consult with the WGFD on any additional mitigation that may be required.

It is unlikely that either alternative would have any immediate impacts to greater sage-grouse. Given the distance from the nearest lek, which is separated from the project area by the Sweetwater River Canyon, it is unlikely that any sage-grouse impacts would occur. Over time, however, the improvements to the riparian areas anticipated from the Proposed Action would benefit greater sage-grouse, specifically late brood rearing habitats. Fencing has the potential to be a collision risk to greater sage grouse. The fencing in Blocks A and C includes marking that increases its visibility. The project area is not in a “high risk of collision area” as mapped by the National Resource Conservation Service (Map 4) but it is possible that the fencing will have an adverse impact to greater sage-grouse although that impact is expected to be minor if it occurs at all.

An additional adverse impact from the fencing that is proposed for Blocks A and C would be to provide predator perches. Anti-perching devices on the corner posts, as required by the RMP, would help to limit this risk but would not completely prevent it. The introduction of the cut sagebrush in Block B is not anticipated to provide a predator perch since it would be of small dimension and relatively unstable.

<sup>2</sup>See the GMCA EA for a discussion of the Core Area Strategy that was adopted by the BLM in the Lander RMP

In the short term, the Proposed Action is likely to have more adverse impacts to greater sage-grouse than the No-Action Alternative but on a medium to long term basis, the benefits to the riparian ecological health under the Proposed Action would be far greater than is likely under the passive approach of the No Action Alternative. This difference in benefits to greater sage-grouse would increase over time as the anticipated improvement in riparian health under the Proposed Action are expected to increase as erosion is reduced and riparian vegetation increases.

Impacts to wildlife and wild horses: Typically, impacts to wildlife from a range improvement project need to be analyzed in an environmental assessment because the long term benefits to habitat from any individual project may not offset the adverse impacts from habitat fragmentation. Given the design of the three proposed projects, adverse impacts to wildlife from the fencing and vegetative treatments are expected to be limited due to the small size of the treated areas with relatively small amounts of fencing. In comparison to the fencing authorized in the GMCA EA, where the BLM's determination that no significant impacts would occur, the fencing proposed by these projects is far less likely to adversely impact wildlife and wild horses.

Any possible adverse impacts from the Proposed Action's fencing and the timber and sagebrush treatments would be offset from the improvements in riparian health and ecosystem function. However, these modest benefits, given the extensive habitat available to wildlife in this area, are the same under both alternatives although under the No-Action Alternative would take far longer to achieve (see Booth, 2014). Moreover, the rapidly changing climate may result in far longer a time period for the No-Action Alternative's benefits to be achieved and even those that have resulted from prior reduced grazing approaches.

### 3.5. Visual Resources

All three treatment areas are in visual resources management (VRM) Class II because of they are located in the National Trails Management Corridor. The objective of Class II management is: "Retain the existing character of the landscape. The level of change to the characteristic landscape will be low. Management activities may be seen but will not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape". The Proposed Action treatment types utilize natural material and, in some places, both of which provide a contrast from the surrounding landscape.

In Lower Granite Creek, the sagebrush and fencing are below the ridge line limiting the view from the Sweetwater Canyon portion of the WSA (VRM Class I) and out of the view of the CDNST to the south, as the treatment area is blocked by intervening terrain; see Map 5.) The visual contrast rating and visibility analysis performed for this project indicate that the contrast will be weak as viewed from the CDNST. As the cut sagebrush decays, it will be less visible but the improvement in the condition of the treated vegetation may provide an increasing contrast from the surrounding untreated sagebrush. The thinning of the sage bush in approximately five acres is unlikely to represent enough of a difference from the surrounding untreated sagebrush to be more than a weak contrast.

The proposed Upper Haypress Creek treatment will be unfenced but the timber will be deliberately placed perpendicular or at angles to the direction of water flow. Moreover, it introduces new color (reddish) and texture to the surrounding riparian vegetation and sagebrush uplands. Although this design increases the likelihood that livestock trailing will not occur in the riparian area or moves it to the higher uplands, there is a possibility that an increase in livestock cattle use will

occur in the untreated areas between the areas receiving the timber. This additional use may be higher than formerly seen and thus has the potential of increasing the overall contrast both with the treated areas and the surrounding area. Because of its near proximity to the CDNST, this project will be in view during the time hikers are walking on the Trail or utilizing the fenced water improvement. This contrast is lessened because the project is located adjacent to the water source fencing but will be increased if informational signs are used to explain the purpose of the treatment. Overtime, as the timber in the Upper Haypress project breaks down and is overgrown with vegetation, the visual contrast will lessen. The anticipated improvement in the ecological function of the area will also benefit visual resources.

As mitigation, the visual resource program identified a requirement to re-assess the success of the treatment at five and ten year periods. At that time, if the anticipated goals of the project were not being met with demonstrated improvement in riparian function and water storage capacity, the BLM will evaluate removing the treatment timbers to take away the contrasting material. It is possible that such an analysis will conclude that the timber has broken down sufficiently so that its continued presence on the ground would be less of an adverse effect than the potential damage to the riparian area by removing partially decomposed material. Since the adverse impacts to visual resources are being offset by the improved riparian condition, if that improvement is not occurring, the degree of adverse impacts to the setting of the CDNST needs to be re-evaluated.

The Coyote Gulch treatment areas will be visible from the CDNST and provide a contrast to the surrounding terrain. This contrast will diminish overtime, particularly if the fences are removed after ten years, and as the vegetation improves and native riparian species shield the treatment mats, this contrast will diminish very quickly. The availability of water in the riparian system means that the re-vegetation is likely to be successful. (Note: if the fences are to remain for longer than ten years or to be re-built in any way, this will require additional NEPA analysis at that time. That analysis will evaluate the benefits to the riparian systems as contrasted with the adverse impacts from a re-built or extended life fence.)

As mitigation, the T-post components of the fences will be painted all one color to be identified by the visual resource specialist (rather than the typical bright green post with a white painted top) so that the contrast is reduced. Similarly, the corner posts will have a low profile perch deterrent painted so that it will not reflect sunlight. Finally, the fences will be marked with low-reflective markers with a relatively subdued or limited movement so that the fence will be made more visible to greater sage-grouse while limiting to the extent possible the contrast to the nearby hikers. This mitigation, coupled with informational material on signs explaining the purpose of the treatment, will reduce the adverse impacts to visual resources/trail setting to below the level of significance.

The No-Action Alternative will continue have the same effect on visual resources as are presently occurring: very slow progress towards improving riparian health with a resulting very slow improvement in the appearance of the areas. It is possible that if the treatments are effective and restored to PFC, the areas will sufficiently contrast with the surrounding untreated landscape as to become more noticeable at least to a trained observer.

### **3.6. National Trails**

The projects are not in the immediate viewshed of the National Historic Trails (see the GMCA EA and the RMP FEIS for more information.) The Upper Haypress is located in the CDNST Destination SRMA and the Lower Granite Creek and Coyote Gulch projects are located in the Undeveloped National Historical Trail Special Recreational Management Area which is managed

area for primarily for solo or small group recreational experience. The RMP did not identify any special recreation management for the area in which the Upper Haypress Creek or Coyote project is located. Thus, the management objectives are to reduce or avoid user conflict or safety issues to Trail users.

None of the projects will have any adverse impacts for recreational use other than the identified impacts to visual setting. The anticipated improvement in riparian and ecological services from the Proposed Action would have a small beneficial impact to the recreational setting but reversing degradation caused by long term livestock grazing. To a minor extent, signs in the Upper Haypress Creek area could promote increased understanding of the BLM's management and thus have an educational benefit. Some users, seeking a primitive experience along the CDNST, might find the project and any signs disruptive to a backcountry experience. While the existing fencing of the water source is a contrast to the unimproved setting, it is considered by users to be for their benefit so as to justify the distraction from the primitive recreational use.

The No-Action Alternative would have no adverse impacts to recreational use but would not have the minor long term benefits of the improvement in the riparian areas.

### 3.7. Cumulative Impacts

With the exception of the re-contouring and remediation of the headcuts on the State lands in Coyote Gulch, there are no foreseeable developments within any of the areas of analysis for cumulative impacts which must be evaluated in conjunction with the direct and indirect impacts from either alternative. (For purpose of this analysis, the NTMC is considered to be the area of analysis for all resources. While this area is larger than would be the analysis area for individual resources such as riparian or greater sage-grouse, identifying future anticipated future disturbance in the greater area will cover the smaller analysis areas.) Under both alternatives, the same proposed additional development will occur, including construction of the Granite Creek-Rocks fence. No additional development has been identified for the Upper Haypress Creek or Coyote Gulch areas.<sup>3</sup>

While not a foreseeable "event" or surface disturbing activity, the BLM anticipates that the fluctuation in the climate of the two areas (called "climate change") will continue as global warming continues to alter weather patterns from earlier times including the last 30 years which was the livestock grazing period assessed in the GMCA EA. Earlier runoffs and increase mean temperatures would both reduce the amount of gradual snow melt and increase more destructive precipitation events such as flooding or fast movement of water thereby increasing erosion in channels or livestock trails. Increasing levels of CO<sub>2</sub> are expected to benefit non-native species rather than native species. Native species are generally less competitive than native species and are more palatable to livestock. Climate change, thus, is expected to cause additional stress to native plants and exacerbate the adverse impacts from livestock grazing.

<sup>3</sup>Ongoing development in the Bison Basin oil and gas unit area may occur but the status of that future development remains unclear. Issues associated with the granting of new oil and gas leases in sage-grouse Core Area are unresolved and the oil and gas operator has no outstanding or identified future applications for permission to drill, plans of development on seismic surveys. The BLM is currently evaluating a proposed underground CO<sub>2</sub> pipeline for Denbury known as the Riley Ridge to Natrona Pipeline. The proposed action for that pipeline, currently being analyzed in an EIS, is authorized, the portion that will be built in the Lander planning area is entirely within designated ROW corridors established by the RMP. Most of the Lost Creek corridor, the proposed location for the Denbury pipeline, was excluded from the NTMC. The proposed pipeline would cross the CDNST in the ¼ mile "tail" section of the NTMC that has been identified for industrial development.

With more precipitation expected to come in the form of rain rather than snow, there will be a greater need for climate resilience over time which will increase the likelihood of adverse impacts from the No-Action Alternative, particularly with regard to riparian health. On the project level basis, the cumulative impacts from climate change when added to the very slow improvement by the continuation of existing management under the No-Action Alternative is relatively unimportant. When carried forward in the entire allotments, that slowness may be insufficient to improve climate resilience and thus make progress towards rangeland health. The Proposed Alternative would provide the BLM with the information necessary to evaluate the two approaches.

### **3.8. Irreversible and Unavoidable Consequences**

The BLM did not identify any irreversible or unavoidable consequences under either alternative. Given the ongoing commitment to monitoring under both alternatives (far more so under the Proposed Action), the BLM determined that it is unlikely that either alternative will result in adverse impacts that will be either irreversible or unavoidable. The results of both alternatives are likely to be apparent in the shorter term although that is more true for the Proposed Action because of its high level of monitoring.

Over time, continued un-remediated degradation of riparian resources as could occur under the No-Action Alternative if the slow, more passive approach identified in the GMCA decisions were insufficient in the face of climate change. It is possible for degraded rangeland conditions and especially riparian areas to pass a “tipping point” where function and health cannot be restored or at least cannot be restored without draconian intervention; see Cagney, et al, 2010. It is possible that this tipping point would be reached more quickly because of climate change and the damage could become irreversible; see Corning, 2010.

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## **Chapter 4. Consultation and Co-ordination and List of Preparers:**

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The BLM conducted extensive internal scoping among LFO resource specialists including the wildlife biologist, the recreation/ visual resource specialist, trail specialist, fire and fuels specialist, range management specialist, GIS experts (Sam Cox and Sarah Wempen), and consultations with former LFO soil scientist Greg Bautz and Range Management Specialist John Likins.

Western Watersheds Project is a 501(c)(3) organization that has expressed a desire to be considered an interested party on BLM decisions in the former Green Mountain Common Allotment. While the proposed vegetation treatments are not considered grazing decisions in that no modification of the grazing plan approved in the GMCA decisions is being considered, the LFO consulted with Western Watersheds on multiple occasions during the structuring of the studies and project area locations. The most recent conversation with WWP prior to this EA was between Curtis Bryan, Lander Supervisory Range Management Specialist, and Jonathan Ratner, WWP's Wyoming project director. Mr. Ratner did not identify any comments or concerns regarding the proposed treatments and did not request to be further advised as to the status of the project.

## 4.1. Sweetwater Working Group

The Sweetwater Basin Working Group has been consulted extensively from the beginning of project design and identification of monitoring and long term project maintenance. The Working Group membership is as follows:

Rhett Abernathy Abernathy Ranches Operator [rhett\\_abernathy@yahoo.com](mailto:rhett_abernathy@yahoo.com)

Terry Booth Agricultural Research Serv. Rangeland Scientist (retired) [terry.booth@ars.usda.gov](mailto:terry.booth@ars.usda.gov)

Curtis Bryan BLM Supervisory Rangeland Management Specialist [cbryan@blm.gov](mailto:cbryan@blm.gov)

John Coffman The Nature Conservancy Southern WY Land Steward [jcoffman@tnc.org](mailto:jcoffman@tnc.org)

Sam Cox BLM Natural Resource Specialist [secox@blm.gov](mailto:secox@blm.gov)

Tim Kramer BLM Fire and Fuels [tkramer@blm.gov](mailto:tkramer@blm.gov)

John Likins BLM Rangeland Management Specialist (retired) [jclikins@bresnan.net](mailto:jclikins@bresnan.net)

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## 4.2. List of Preparers

The following members of the Lander Field Office participated in the drafting and review of this document:

*Chapter 4 Consultation and Co-ordination  
and List of Preparers:  
Sweetwater Working Group*

Curtis Bryan, Supervisory Rangeland Management Specialist

Tim Vosburgh, Wildlife Biologist

Melissa Rutledge, Rangeland Management Specialist

Jared Oakleaf, Visual Resource Management Specialist

Sarah Wempen, GIS Specialist

Sam Cox, Natural Resource Specialist

Tim Kramer, Fire and Fuels Specialist

Kristin Yannone, Planner

Rubel Vigil, Assistant Field Manager for Resources

Richard Vander Voet, Field Manager

### **4.3. Tribal Consultation**

The BLM cultural resource program determined that no tribal consultation was required for the proposed project areas given the extent of the current degraded condition and the standard cultural stipulations to preserve cultural artifacts.

## **Chapter 5. References**

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# Appendix A. Maps

General Overview

**Map A.1. [dctm://eplanning\\_prod/090003e8808a89d6?DMS\\_OBJECT\\_SPEC=OBJECT\\_ID](dctm://eplanning_prod/090003e8808a89d6?DMS_OBJECT_SPEC=OBJECT_ID)**

Watershed

Range Boundaries

National Trail Management Corridor (NTMC)

Greater Sage-Grouse Fence Collision Risk

Sweetwater Canyon Wilderness Study Area (WSA)

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## **Appendix B. Project Proposal Six Sites**

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## **Appendix C. Roll-Text Brochure**

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## **Appendix D. Photos**

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# **Appendix E. Stipulations and Clearances**